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10/626,055

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Khoi Nhu Hoang

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Daniel M. DeVos
Blakely, Sokoloff, Taylor & Zafman LLP
Seventh Floor
12400 Wilshire Boulevard
Los Angeles, CA 90025-1030

EXAMINER

LI, SHI K

ART UNIT

PAPER NUMBER

2613

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/626,055	Applicant(s) HOANG ET AL.	
	Examiner Shi K. Li	Art Unit 2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 September 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-11,13-16,18-21,23-27,30-46,49-53,56-60,62-67,69-72,74 and 75 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/11/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

Continuation of Disposition of Claims: Claims pending in the application are 1-3,5-11,13-16,18-21,23-27,30-46,49-53,56-60,62-67,69-72,74 and 75.

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 37-42, 50-53, 56, 64-67, 69-72 and 74-75 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 37-42, 50-53, 56, 64-67, 69-72 and 74-75 claim a machine-readable storage medium which can be electrical, optical, acoustical or other form of propagated signals. A signal is not a process because it is not a serial steps; a signal has no physical structure, thus it does not fit within the definition of a machine; a signal is not a matter but a form of energy and therefore it not a composition; and a signal is a form of energy, thus it does not fit the definition of manufacture.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-3, 5-11, 13-16, 18-21, 23-27, 30-46, 49-53, 56-60, 62-67, 69-72 and 74-75 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation “wherein each service level topology is a network topology smaller than an entire network topology of the optical network”. However, it is unclear how to determine whether one topology is smaller or bigger than another topology.

Independent claims 7, 14, 18, 24, 31, 37, 43, 50, 57, 64 and 71 recite similar limitations.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Golmie et al. (N. Golmie et al., "A Differentiated Optical Services Model for WDM Networks", IEEE Communications Magazine, February 2000) in view of Jukan et al. (A. Jukan et al., "Constraint-based Path Selection Methods for On-demand Provisioning in WDM Networks", IEEE INFOCOM 2002, 23-27 June 2002) and Desnoyers et al. (U.S. Patent 6,791,948 B1).

Regarding claims 1, 14, 18 and 31, Golmie et al. teaches in FIG. 3 and Table 1 to divide a WDM network into separate service levels. The difference between Golmie et al. and the claimed invention is that Golmie et al. does not teach how to determine service level topology. Jukan et al. teaches on page 827 left col. continuity constraints. Jukan et al. teaches on page 831 right col. distributed discovery of wavelength paths by each access node. One of ordinary skill in the art would have been motivated to combine the teaching of Jukan et al. with the WDM network of Golmie et al. because the method of Jukan et al. allow automatic discovery of network topology in a mesh network. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the decentralized network topology discovery method, as taught by Jukan et al., in the WDM network of Golmie et al.

The combination of Golmie et al. and Jukan et al. still fails to teach to use available wavelength for determining network topology. However, it is obvious to one of ordinary skill in the art that the method of Jukan et al. can be used to discovered network topology. For example,

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Desnoyers et al. teaches in col. 2, lines 56-65 to use request message to discover network topology. For network topology discovery, one of ordinary skill in the art would have used all available wavelengths instead of the idle wavelengths. One of ordinary skill in the art would have been motivated to combine the teaching of Desnoyers et al. with the modified WDM network of Golmie et al. and Jukan et al. because using request message requires less processing power and information storage capacity as compared with conventional method such as OSPF. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the probing method of Jukan et al. for topology discovery as suggested by Desnoyers et al. because using request message requires less processing power and information storage capacity as compared with conventional method such as OSPF.

Regarding claim 2, 19 and 32, Golmie et al. teaches in Table 1 BER.

Regarding claim 3, the modified method of Golmie et al., Jukan et al. and Desnoyers et al. determines service level network topology.

Regarding claims 5-6 and 15, Jukan et al. teaches on page 827, left col. wavelength continuity constraints.

Regarding claim 7, Desnoyers et al. teaches in col. 19, lines that the same method can be used for determine changes for maintaining network topology.

Regarding claim 8, Golmie et al. teaches in Table 1 BER and other service level parameters.

Regarding claim 20 and 23, Jukan et al. teaches on page 828, left col. service-specific wavelength set.

Regarding claim 24, Desnoyers et al. teaches in FIG. 2 network topology database 33.

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Regarding claim 25, Golmie et al. teaches in Table 1 BER and other service level parameters.

Regarding claims 26-27, the modified method of Golmie et al., Jukan et al. and Desnoyers et al. determines service level network topology.

Regarding claim 34, Jukan et al. teaches comparing service-specific wavelength sets.

Regarding claims 35-36, the modified method of Golmie et al., Jukan et al. and Desnoyers et al. determines service level network topology by sending message to find reachable paths.

Regarding claim 37, Desnoyers et al. teaches in FIG. 2 processor and system memory. It is well known to one of ordinary skill in the art that instructions for controlling the processor can be stored in memory.

Regarding claim 38, Golmie et al. teaches in Table 1 BER and other service level parameters.

Regarding claim 40, Jukan et al. teaches comparing service-specific wavelength sets.

Regarding claims 41-42, the modified method of Golmie et al., Jukan et al. and Desnoyers et al. determines service level network topology by sending message to find reachable paths.

Regarding claims 43-46, Jukan et al. teaches real-time path setup.

Regarding claim 49, Jukan et al. teaches on page 827, left col. wavelength continuity constraints.

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Regarding claim 50, Desnoyers et al. teaches in FIG. 2 processor and system memory. It is well known to one of ordinary skill in the art that instructions for controlling the processor can be stored in memory.

Regarding claims 51-53, Jukan et al. teaches real-time path setup.

Regarding claim 56, Jukan et al. teaches on page 827, left col. wavelength continuity constraints.

Regarding claims 71-72, Desnoyers et al. teaches in FIG. 2 network topology database 33.

6. Claims 9, 33, 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Golmie et al., Jukan et al. and Desnoyers et al. as applied to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72 above, and further in view of Lang et al. (Lang et al., "Link Management Protocol", draft-ietf-mpls-lmp-02.txt, 2001).

Golmie et al., Jukan et al. and Desnoyers et al. have been discussed above in regard to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72. The difference between Golmie et al., Jukan et al. and Desnoyers et al. and the claimed invention is that Golmie et al., Jukan et al. and Desnoyers et al. do not teach link management protocol. Link management protocol is well known in the art for tracking link status of links between adjacent nodes. Lang et al. teaches the details of a link management protocol (LMP). One of ordinary skill in the art would have been motivated to combine the teaching of Lang et al. with the modified WDM network of Golmie et al., Jukan et al. and Desnoyers et al. because LMP provides verification, link property correlation and fault management functions for managing links. Thus it would have been obvious to one of ordinary skill in the art at the time the

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invention was made to use LMP for managing links, as taught by Lang et al., in the modified WDM network of Golmie et al., Jukan et al. and Desnoyers et al. because LMP provides verification, link property correlation and fault management functions for managing links.

7. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Golmie et al., Jukan et al. and Desnoyers et al. as applied to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72 above, and further in view of Okajima et al. (U.S. Patent Application Pub. 2002/0120766 A1).

Golmie et al., Jukan et al. and Desnoyers et al. have been discussed above in regard to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72. The difference between Golmie et al., Jukan et al. and Desnoyers et al. and the claimed invention is that Golmie et al., Jukan et al. and Desnoyers et al. do not teach comparing parameters of links with service level parameters. Okajima et al. further teaches in FIG. 5 to monitor variable link metrics to determine whether link metrics have been changed and update link metrics accordingly. One of ordinary skill in the art would have been motivated to combine the teaching of Okajima et al. with the modified WDM network of Golmie et al., Jukan et al. and Desnoyers et al. because a link must meet service level criteria for providing the associated QoS. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to compare link parameters with classification criteria, as taught by Okajima et al., in the modified WDM network of Golmie et al., Jukan et al. and Desnoyers et al. because a link must meet service level criteria for providing the associated QoS.

8. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Golmie et al., Jukan et al. and Desnoyers et al. as applied to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38,

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40-46, 49-53, 56 and 71-72 above, and further in view of Matsuura et al. (U.S. Patent Application Pub. 2003/0198227 A1).

Golmie et al., Jukan et al. and Desnoyers et al. have been discussed above in regard to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72. The difference between Golmie et al., Jukan et al. and Desnoyers et al. and the claimed invention is that Golmie et al., Jukan et al. and Desnoyers et al. do not teach to use number of wavelength conversion as criteria. Matsuura et al. teaches in paragraphs [0014] and [0017] that wavelength conversion devices are expensive and the number of wavelength conversion is kept to a minimum in setting up a lightpath. One of ordinary skill in the art would have been motivated to combine the teaching of Matsuura et al. with the modified WDM network of Golmie et al., Jukan et al. and Desnoyers et al. to limit the number of wavelength conversion used because wavelength conversion devices are expensive and a OXC can have only limited number of wavelength conversion devices to be shared for all lightpaths. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use number of wavelength conversions as a criteria for service level, as taught by Matsuura et al., in the modified WDM network of Golmie et al., Jukan et al. and Desnoyers et al. to limit the number of wavelength conversions used because wavelength conversion devices are expensive and a OXC can have only limited number of wavelength conversion devices to be shared for all lightpaths.

9. Claims 16 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Golmie et al., Jukan et al. and Desnoyers et al. as applied to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72 above, and further in view of Battou et al. (U.S. Patent 7,013,084 B2).

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Golmie et al., Jukan et al. and Desnoyers et al. have been discussed above in regard to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72. The difference between Golmie et al., Jukan et al. and Desnoyers et al. and the claimed invention is that Golmie et al., Jukan et al. and Desnoyers et al. do not teach a centralized network management server. Battou et al. teaches in FIG. 30 network management system (NMS) for managing a network. Battou et al. teaches in FIG. 34 topology manager of NMS for providing a topological view of the network. One of ordinary skill in the art would have been motivated to combine the teaching of Battou et al. with the modified WDM network of Golmie et al., Jukan et al. and Desnoyers et al. because a NMS provides a topological view of the network to craftsperson for operation and maintenance. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a NMS, as taught by Battou et al., in the modified WDM network of Golmie et al., Jukan et al. and Desnoyers et al. because a NMS provides a topological view of the network to craftsperson for operation and maintenance.

10. Claims 30 and 57-60, 62-67, 69-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Golmie et al., Jukan et al. and Desnoyers et al. as applied to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72 above, and further in view of Melaku et al. (U.S. Patent Application Pub. 2003/0074443 A1).

Golmie et al., Jukan et al. and Desnoyers et al. have been discussed above in regard to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72. The difference between Golmie et al., Jukan et al. and Desnoyers et al. and the claimed invention is that Golmie et al., Jukan et al. and Desnoyers et al. do not teach to change service level. Melaku et al. teaches in FIG. 5 QoS broker for handling service level change request. Melaku et al. teaches in

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paragraph. [0056] that if a user decides to change QoS requirements in the midst of a session, new resources are to be reallocated and a new path that meets the requested QoS is established.

One of ordinary skill in the art would have been motivated to combine the teaching of Melaku et al. with the modified WDM network of Golmie et al., Jukan et al. and Desnoyers et al. because a QoS broker allows users to change service level depending on changes of their application needs. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a QoS broker for handling service level change requests, as taught by Melaku et al., in the modified WDM network of Golmie et al., Jukan et al. and Desnoyers et al. because a QoS broker allows users to change service level depending on changes of their application needs.

11. Claims 74-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Golmie et al., Jukan et al. and Desnoyers et al. as applied to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72 above, and further in view of Deo ("Graph Theory with Applications to Engineering and Computer Science" by N. Deo, Prentice-Hall, 1974, pp. 137-144).

Golmie et al., Jukan et al. and Desnoyers et al. have been discussed above in regard to claims 1-3, 5-8, 14-15, 18-20, 23-27, 31-32, 34-38, 40-46, 49-53, 56 and 71-72. The difference between Golmie et al., Jukan et al. and Desnoyers et al. and the claimed invention is that Golmie et al., Jukan et al. and Desnoyers et al. do not teach to use a table or a tree to represent service level topology. Networks are mathematically represented as graphs. Deo teaches in chapter 7 to represent graphs as matrix (or table). One of ordinary skill in the art would have been motivated to combine the teaching of Deo with the modified machine-readable medium of Golmie et al., Jukan et al. and Desnoyers et al. to represent network as matrix because matrices are better for

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computer processing. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to represent service level topology structures as table, as taught by Deo, in the modified machine-readable medium of Golmie et al., Jukan et al. and Desnoyers et al.

Response to Arguments

12. Applicant's arguments filed 11 September 2008 have been fully considered but they are not persuasive.

Regarding the 35 U.S.C. 101 rejection, the Applicant have amended the claims to claim a machine readable storage medium and argues that the Office recognizes that a storage medium does not cover a carrier wave. However, the Applicant fails to provide any evidence for supporting the argument. On the contrary, instant specification teaches on page 21, paragraph [0087] “Such software and/or firmware can be **store** and communicated (internally and with other access nodes over the network) **using machine-readable media**, such as magnetic disks; optical disks; random access memory; read only memory; flash memory devices; electrical, optical, acoustical or other form of propagated **signals** (e.g., carrier waves, infrared signals, digital signals, etc.); etc.” (Emphasis added) It is also well known in the art that computer readable storage medium includes carrier wave. For example, Marshall et al. (U.S. Patent 7,286,756 B1) teaches in col. 6, lines 21-23 “Additionally, a data **signal** embodied in a **carrier wave** (e.g., in a network including the Internet) may be the **computer readable storage medium**.” (Emphasis added)

The Applicant argues that the combination of Golmie et al., Jukan et al. and Desnoyers et al. does not describe claim 1, as amended. The Applicant argues that Jukan discloses

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discovering paths between a single source destination pair. However, Jukan does not disclose "determining service level topologies ..., said each service level topology.....comprises end to end paths satisfying the corresponding service level from that access node to all other reachable access nodes in said optical network as destinations." However, Golmie et al. teaches service levels. Since service level is defined for a lightpath (e.g., Golmie et al. teaches on page 70, right col., second paragraph "A DoS service is defined by a set of parameters that characterize the quality and impairments of the optical signal carried over a lightpath), the combination of Golmie et al., Jukan et al. and Desnoyers et al. determines lightpaths for separate service levels, or service level topologies.

The Applicant argues that none of Golmie, Jukan, or Desnoyers discloses the structure of a network topology database. The Examiner disagrees. Desnoyers et al. teaches in col. 3, lines 1-3 building a network topology database. Since the combination of Golmie et al., Jukan et al. and Desnoyers et al. teaches service level topologies, the database has the structure of service level topologies in terms of lightpaths.

The Applicant argues "In addition, storing service level topology structures that references a set of end to end paths satisfying the corresponding service level is not obvious to one of skill in the art. In order to support an obvious rejection, the Examiner must show that the difference between the prior art cited and the claimed invention would have been obvious to one of skill in the art (Fed. Reg. Vol. 72, No. 195, p. 57528). One example of one of skill in the art can be found in the well-known Open Shortest Path First (OSPF) protocol. OSPF databases and Shortest Path First (SPF) trees that are not portioned into separate structures based on service level. It should be noted that the since OSPF is a protocol typically used in optically networking

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to create topology databases, Moy would be considered one of skill in the art. Furthermore, even though it may have known at the time of Moy that a database may be organized in a different fashion, Moy (and others who use OSPF) chose to organize the topology database as a link/lambda state database and/or a link/lambda SPF tree, instead of a topology database with partitioned based on service level. Thus, because Moy organized the OSPF database(s) differently than Applicant's topology database and Moy is one of skill in the art, it would not have been obvious to one of skill in the art to try to store separate service level topology structures that reference a set of end to end paths satisfying the corresponding service level.” However, the rejection of claim 1 is based on Golmie et al., Jukan et al. and Desnoyers et al. instead of Moy. Section 35 U.S.C. 103(a) clearly states that “A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” while the Applicant argues that a patent may be obtained if it is not obvious to one of ordinary skill in the art.

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 571 272-3031. The examiner can normally be reached on Monday-Friday (7:30 a.m. - 4:30 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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28 November 2008

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/Shi K. Li/

Primary Examiner, Art Unit 2613